

THE COLUMBIA LANCE NEMATODE, HOPLOLAIMUS COLUMBUS SHER, 1963

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The Columbia lance nematode, Hoplolaimus columbus Sher, 1963, was recovered originally from soil about the roots of soybeans, Glycine max (L.) Merrill, growing in South Carolina. Since then substantial reductions in cotton, Gossypium hirsutum L., and soybean yields in both Georgia and South Carolina have been attributed to this nematode.

Some of the more severely infected soybeans plants are dwarfed, chlorotic, and have very few seed pods. Cotton grown in heavily infested fields is typified by dwarfed plants, leaves with nutrient deficiency symptoms, squares which have shedding, and bolls which are small or shedding.

Host-Parasite Relationship

Fields heavily infested with the Columbia lance nematode may have areas with poor stands of cultivated crops. Plants damaged by this nematode possess very sparse root systems which are limited in their ability to take up water and conduct nutrients. Columbia lance nematode frequently occurs as an ecto-endoparasite on soybean and cotton. However, it behaves as an ectoparasite in feeding on alfalfa callous root tissue. Based upon nematode feeding signs and necrotic reaction of roots to feeding by this nematode, the older roots appear to be more severely damaged by the nematodes than are the younger roots. Columbia lance nematodes feed as ectoparasites upon cortical cells (fig. 1) in the maturation zone of the root. Feeding may occur also in the inner cells of the cortex near the hypodermis (fig. 2). The nematodes feed for a longer period and to greater depth on older roots. When the nematodes become disassociated from feeding sites, they again orient themselves toward the root and have no difficulty in locating new feeding sites.

Geographic Distribution and Host Range

H. columbus is known to occur in Georgia, South Carolina, India, and West Malaysia. Excellent host crops of the nematode include Cynodon dactylon (L.) Ders. (common Bermuda grass), Triticum aestivum L. (wheat), Zea mays L. (sweet corn), and Panicum miliaceum L. (millet). Other less suitable hosts are Glycine max (L.) Merrill (soybean), Gossypium hirsutum L. (cotton), Phaseolus lunatus L. (lima bean), P. vulgaris L. (common bean), Citrullus lanatus (Thunb.) Matsum. & Nakai (watermelon), and Hibiscus esculentus L. (okra). Weed hosts of H. columbus include Amaranthus retroflexus L. (red root pigweed), Cassia obtusifolia L. (sickle-pod), Crotalaria spectabilis Roth. (showy crotalaria), Cyperus rotundus L. (purple nut sedge), Echinochloa crus-galli (L.) Beauvois (barnyardgrass), Ipomoea purpurea L. Roth. (tall morning glory), and Vigna unguiculata (L.) Walt. ssp. Unguiculata (cowpea).

H. columbus is a polyphagous nematode capable of feeding on a variety of plants in different taxonomic groups. Crop rotations should be carefully chosen in fields infested by this nematode. Control of weeds should be considered, since several weeds are excellent hosts of the Columbia lance nematode.

### Control

Chemical control of H. columbus has been obtained by application of 7 gal/A of D-D (1,3-dichloropropane + 1,2-dichloropropane), 3 lb ai/A of phenamiphos (Nemacur) ethyl 3-methyl-4-(methylthio) phenyl (1-methylethyl) phosphoramidate and 2 lb ai/A of carbofuron (Furadan) 2,3-dihydro-2,2-dimethyl-7-benzofuronyl methylcarbonate. Soybean yields were increased by as much as 45 bu/A when nematocides were applied to H. columbus-infested fields.



Fig. 1. Hoplolaimus columbus embedded in soybean root

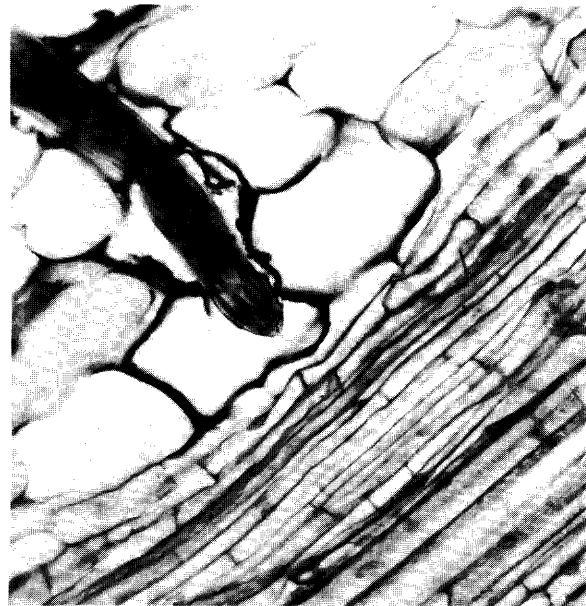


Fig. 2. Hoplolaimus columbus in inner cortex of cotton root

(Photographs furnished by Dr. Stephen A. Lewis, Clemson University, Clemson, S. C.)

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